

PHYTOSOCIOLOGICAL STUDIES ON TABLE MOUNTAIN, SOUTH AFRICA:

2. THE FRONT TABLE

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ABSTRACT

The Braun-Blanquet phytosociological technique was used to describe the vegetation of the study area. Two communities, one with two sub-communities and an ecotonal community between the two sub-communities, are recognised. The siting of the Cableway station, with the attendant large volume of tourist traffic, has led to serious vegetation degradation in the immediate vicinity. Some recommendations as to how this situation may be improved are given.

UITTREKSEL

FITOSOSIOLOGIESE STUDIES OP TAFELBERG, SUID-AFRIKA:

2. DIE VOORTAFEL

Die Braun-Blanquet fitososiologiese tegniek was gebruik om die plantegroei te beskryf. Drie gemeenskappe, gebaseer op omgewingsfaktore en flora word erken. Die plasing van die Sweefspoorstasie met die gepaardgaande groot volume besoekersverkeer het tot ernstige agteruitgang van die plantegroei van die area gelei. Voorstelle word gemaak om die toestand te herstel.

INTRODUCTION

The study area was the Front Table of Table Mountain, above the 1 000 m contour (see Fig. 2. in Glyphis, Moll and Campbell, 1978). The plateau is roughly triangular in shape with the long axis orientated east-west, about 3 km long. A geological fault, Platteklip Gorge, divides the plateau into an Eastern and a Western Table.

GEOLOGY AND TOPOGRAPHY

The underlying rock of the plateau is Table Mountain Sandstone (Du Toit, 1954). Between exposed areas of bedrock and boulder formations a coarse white or grey sand overlies a dark humic soil; combined these two layers average approximately 200 mm in depth.

Drainage is variable with the flat areas near the plateau centre becoming water-logged during the rainy season, while those on the periphery of the plateau are usually well drained. Around the periphery there are also seepage areas and

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poorly drained rock beds with dark grey, or black soils to depths of about one metre; these are usually wet, or at least moist, throughout the year.

CLIMATE

Table Mountain lies in a mediterranean climatic region, characterised by hot, dry summers and cool, wet winters. The Front Table has a mean annual rainfall of 1 440 mm, recorded at the Upper Cableway station (Schulze, 1965). Mists, carried over the plateau by the summer south-easterly winds, were shown by Marloth (1903, 1905) and Nagel (1956, 1962) to be a very important additional source of moisture. The winter rainfall and summer mists, therefore, ensure that the plateau has almost year round precipitation (see Fig. 3 in Glyphis, Moll and Campbell, 1978).

Temperature variation over the whole Mountain, in different seasons, is not pronounced. On the plateaus (front and back) the mean monthly temperature varies from 18 °C in summer to 7 °C in winter (Schulze, 1965).

METHODS

The Braun-Blanquet phytosociological technique, as described by Werger (1974), was used in this survey. Site selection and distribution of relevés was subjective. Only perennially identifiable species were recorded. A relevé area of 5 × 5 m was used and was found to be adequate as few species were found outside each plot. A total of thirty-eight relevés were sampled and the floristic and environmental data collected were entered on a standard field-sheet for each relevé.

Using a computer programme coefficients of similarity for each relevé, based on floristic data, were calculated (Campbell and Moll, 1976). From this information a dendrogram, showing the floristic relationship of the relevés, was drawn. Dendrogram groups, with certain minor adjustments, were used to construct the final phytosociological table. Species sequence in the table was arranged subjectively (Table 1).

DISCUSSION

Description of the Communities

1. *Maytenus*—*Athanasia* Community

The single relevé (140) is provisionally used to describe this community, which occurred on a rocky, well-drained, steep cliff where the soil was dark grey to black, and from 100 to 300 mm deep. The relevé itself was sited near the Upper Cableway station and contained, in addition to the dominants *Maytenus oleoides* and *Athanasia parviflora* the following species, *Salvia africana*, *Myrsine africana*, *Peucedanum galbanum*, *Cliffortia ruscifolia*, *Anthospermum aethiopicum* and *Ehrharta ramosa*.

Differential species

Hypolaena crinalis
Restio compressus
Senecio crispus

Elegia-Pentaschistis variation Differential species

Elegia thrysiflora
Erica sp.
Pentaschistis pallescens
Berzelia lanuginosa

Restio Community Differential species

Chondropetalum ebracteatum
Ursinia nudicaulis
Ehrharta setacea
Chondropetalum mucronatum
Villarsia ovata
Restio sarcocladus

Accompanying species

Erica mollis
Grubbia rosmarinifolia
Pentaschistis colorata
Helichrysum cymosum
Adenandra umbellata
Gibbbaria ilicifolia
Lampranthus falciformis
Mairia crenata

Species not included in the table above:

Carpacoea spermacoea 139+, 233+; *Centella eriantha* 249+; *Cheilanthes multifida* 140+; *Clutia alaternoides* 139(+); *Cullumia ciliaris* 139+; *Diosma oppositifolia* 235+; *Elegia neesia* 243+; *Epischoenus quadrangularis* 234,2, 139+; *Erica diosmaefolia* 138+; *Erica emdetrifolia* 298+; *Erica* (species unidentified) 296+; *Euryops pectinatus* 140+; *Ficinia acuminata* 138+; *Ficinia composita* 140+; *Ficinia* (species unidentified) 225+; *Ficinia zeyheri* 243,2; *Helichrysum grandiflorum* 138+; *Hermas villosa* 138+; *Leontonyx spathulatus* 238,2; *Metalasia divergens* 239+; *Myrica humilis/diversifolia* 139+, 137+; *Nemesia lucida* 140+; *Othonna quinqueidentata* 243,2; *Pentaschistis aspera* 140+; *Pentaschistis curvifolia* 244+, 230,1; *Protea cynaroides* 139(+); *Prismatocarpus sessilis* 238(+); *Psoralea pinnata* 139,1; 243+; *Selago spuria* 230(+); *Senecio bipinnatus* 139(+); *Senecio rigidus* 140+; *Stoebe cinerea* 242(+), 243,1; *Struthiola ciliata* 137+; *Tetraria brevicaulis* 297(+), 244+; *Tetraria triangularis* 138,1, 243,1; *Thesium strictum* 241+, 240+; *Ursinia dentata* 243+.

2. Restio Community

The major physiognomic component of the upper plateau is a closed *Restio* Community less than 1 m tall, in which *Chondropetalum ebracteatum*, *Ursinia nudicaulis*, *Ehrharta setacea*, *Chondropetalum mucronatum*, *Villarsia ovata* and *Restio sarcoclados* are the differential species. Two major sub-communities, separated by a fairly well-differentiated ecotonal group of species (G) occur within the Restio Community.

(i) *Watsonia-Penaea* Sub-community (A to F). This sub-community occurs on the shallow, essentially pallid soils overlying bedrock (see Table 2) and has been burnt fairly frequently in recent years. Important differential species, apart from *Watsonia* spp. and *Penaea mucronata*, are *Cliffortia ruscifolia*, *Thamnochortus nutans* and *Erica hispidula*. It is noteworthy that *T. nutans*, which is common on the upper plateau, has an extremely limited distribution in the Fynbos Biome as a whole, being restricted to the top of Table Mountain and the top of the Constantiaberg on the Cape Peninsula.

Within the sub-community there occur a number of variations, these are discussed below:

The *Restio-Schizaea* variation (B) occurs on the temporarily moist, relatively steep sites and has as differential species *Restio perplexus*, *Schizaea pectinata*, *Aristea* spp., *Cassytha ciliolata* and *Anemone capensis*. On wetter, flatter sites, with shallow soils, *Simocheilus depressus* and *Erica plukenetii* which also occur in this variation, are able to grow successfully indicating an ecotonal type (A). On somewhat deeper, pallid soils that have not been burned for five or seven years *Tetraria cuspidata* and *Leucadendron strobilinum* are more common (C), and where fire has burned the vegetation recently *Euryops abrotanifolius*/*Ursina* sp. and *Elegia* spp. occur, but *Erica coccinea* and *L. strobilinum* are absent (D).

On those shallow, pallid soils that have a high surface rock cover a *Centella* variation occurs (E). Differential species of this variation, apart from *Centella caespitosa*, are *Helichrysum pinifolium*, *Chondropetalum deustum* and *Anaxeton arborescens*. On flatter sites where the surface rock cover is less *Centella* does not occur and *Restio bifidus* and *Chrysothrix capensis* form an ecotonal variation (G) between the *Watsonia-Penaea* Sub-community and the *Restio-Hypolaena* Sub-community. Here the topography is relatively flat, soils deeper, rock cover is low, and *Restio bifidus*, *Chrysothrix capensis*, *Afrachneria capensis* and *Stoebe incana* are more frequent.

(ii) *Restio-Hypolaena* Sub-community (H & I). This sub-community occurs on deeper, essentially pallid, seasonally wet soils on relatively flat sites. Differential species are *Hypolaena crinalis*, *Restio compressus* and *Senecio crispus*. Two variations, one characterised by *Elegia thrysiflora*, *Erica* sp., *Pentachistis pallezens* and *Berzelia lanuginosa* on the deepest soils (I), and the other characterised by the absence of these species and high cover abundance values of *H. crinalis*, occur (H).

Anthropogenic influences

The location of the Upper Cableway station on the Western Table is responsible for a large volume of tourist traffic on the Front Table. This has resulted in extensive degradation of the vegetation especially within close proximity of the station and restaurant. Further away there is also much damage and despoilment along the edges of the foot-paths particularly along the front face.

It is, therefore, strongly recommended that well landscaped paths be constructed in areas where degradation is visible. This would, in fact, entail the planning of the path network on the whole Western Table, so that a few major routes are hardened. Visitor access should then be restricted to these paths to prevent further extensive degradation of the plant communities and allow their recovery.

CONCLUSIONS

Two distinct plant communities are recognised and described using the Braun-Blanquet phytosociological technique. One community, the *Restio* Community, has two sub-communities and an ecotonal variation. The important environmental factors determining these communities are soil depth, moisture content and rock cover. The trampling of the area by visitors to Table Mountain is causing concern regarding the future conservation status of the *Restio* Community.

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